Developmental Biology

An International Journal Published under the Auspices of the Society for Developmental Biology

EDITOR-IN-CHIEF: Anthony P. Mahowald

ASSOCIATE EDITORS

Merton K. Bernfield
Ira B. Black
Peter J. Bryant
Charles P. Emerson, Jr.
David Hirsh
Richard Hynes
William F. Loomis, Jr.
Rudolf A. Raff
Gerald M. Rubin
L. Dennis Smith
Davor Solter
Robert L. Trelstad
Victor D. Vacquier
Virginia Walbot

EDITORIAL ASSISTANT: Linda L. Goldstein

ADVISORY EDITOR
Igor B. Dawid

VOLUME 103, 1984

ACADEMIC PRESS, INC.

San Diego Orlando San Francisco New York London
Toronto Montreal Sydney Tokyo São Paulo

Copyright © 1984 by Academic Press, Inc.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (21 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1984 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0012-1606/84 $3.00

MADE IN THE UNITED STATES OF AMERICA

Contents of Volume 103

NUMBER 1, MAY 1984

Review

RICHARD NUCCITELLI AND ROBERT D. GREY. Controversy over the Fast, Partial, Temporary Block to Polyspermy in Sea Urchins: A Reevaluation 1

Full Papers

PAUL B. GREEN. Shifts in Plant Cell Axiality: Histogenetic Influences on Cellulose Orientation in the Succulent, *Graptopetalum* 18

PAUL N. ADLER AND MARGARET MACQUEEN. Cell Proliferation and DNA Replication in the Imaginal Wing Disc of *Drosophila melanogaster* 28

ROBERT W. KEANE, LEAH A. LIPSICH, AND JOAN S. BRUGGE. Differentiation and Transformation of Neural Plate Cells 38

HIROSHI KUROMI AND YOSHIAKI KIDOKORO. Nerve Disperses Preexisting Acetylcholine Receptor Clusters prior to Induction of Receptor Accumulation in *Xenopus* Muscle Cultures 53

EILEEN D. ADAMSON AND JENNIFER MEEK. The Ontogeny of Epidermal Growth Factor Receptors during Mouse Development 62

J. A. KESSLER, J. E. ADLER, G. M. JONAKAIT, AND I. B. BLACK. Target Organ Regulation of Substance P in Sympathetic Neurons in Culture 71

RONALD W. LENNOX AND LEONARD H. COHEN. The Alterations in H1 Histone Complement during Mouse Spermatogenesis and Their Significance for H1 Subtype Function 80

MARGARET B. SCHWARTZ, RICHARD B. IMBERSKI, AND THOMAS J. KELLY. Analysis of Metamorphosis in *Drosophila melanogaster:* Characterization of *giant,* an Ecdysteroid-Deficient Mutant 85

JUN TAKANO. Genetic Analysis of Developmental Mechanisms in Hydra. IX. Effect of Food on Development of a Slow-Budding Strain (L4) 96

PREMA MICHAEL. Are the Primordial Germ Cells (PGCs) in Urodela Formed by the Inductive Action of the Vegetative Yolk Mass? 109

BRUCE A. FENDERSON, DEBORAH A. O'BRIEN, CLARKE F. MILLETTE, AND E. M. EDDY. Stage-Specific Expression of Three Cell Surface Carbohydrate Antigens during Murine Spermatogenesis Detected with Monoclonal Antibodies 117

A. SUE MENKO, KATHLEEN A. KLUKAS, AND ROSS G. JOHNSON. Chicken Embryo Lens Cultures Mimic Differentiation in the Lens 129

EARL H. WEBSTER, JR., ALENE F. SILVER, AND NEIL I. GONSALVES. The Extracellular Matrix between the Optic Vesicle and Presumptive Lens during Lens Morphogenesis in an Anophthalmic Strain of Mice 142

ARLENE GONZÁLEZ-SÁNCHEZ AND DAVID BADER. Immunochemical Analysis of Myosin Heavy Chains in the Developing Chicken Heart 151

P. TALBOT AND G. DICARLANTONIO. Ultrastructure of Opossum Oocyte Investing Coats and Their Sensitivity to Trypsin and Hyaluronidase 159

FRANK J. LONGO. Transformations of Sperm Nuclei Incorporated into Sea Urchin (*Arbacia punctulata*) Embryos at Different Stages of the Cell Cycle 168

YUZO NIKI. Developmental Analysis of the *grandchildless (gs(1)N26)* Mutation in *Drosophila melanogaster:* Abnormal Cleavage Patterns and Defects in Pole Cell Formation 182

JOHN E. MORRIS AND SANDRA W. POTTER. A Comparison of Developmental Changes in Surface Charge in Mouse Blastocysts and Uterine Epithelium Using DEAE Beads and Dextran Sulfate *in Vitro* 190

JOEL S. PACHTER AND RONALD K. H. LIEM. The Differential Appearance of Neurofilament Triplet Polypeptides in the Developing Rat Optic Nerve 200

TAMAYUKI SHINOMURA, KOJI KIMATA, YASUTERU OIKE, NOBUAKI MAEDA, SHINYA YANO, AND SAKARU SUZUKI. Appearance of Distinct Types of Proteoglycan in a Well-Defined Temporal and Spatial Pattern during Early Cartilage Formation in the Chick Limb 211

R. SENNERSTAM AND J. O. STRÖMBERG. A Comparative Study of the Cell Cycles of Nullipotent and Multipotent Embryonal Carcinoma Cell Lines during Exponential Growth 221

JEAN-PAUL SWERTS, AGATHE LE VAN THAÏ, AND MICHEL J. WEBER. Regulation of Enzymes Responsible for Neurotransmitter Synthesis and Degradation in Cultured Rat Sympathetic Neurons ... 230

GARY M. WESSEL, RICHARD B. MARCHASE, AND DAVID R. MCCLAY. Ontogeny of the Basal Lamina in the Sea Urchin Embryo ... 235

M. B. COUKELL, A. M. CAMERON, C. M. PITRE, AND J. D. MEE. Developmental Regulation and Properties of the cGMP-Specific Phosphodiesterase in *Dictyostelium discoideum* 246

Brief Notes

KOHJI IKENISHI, TAKASHI OKUDA, AND SAKIKO NAKAZATO. Differentiation of Presumptive Primordial Germ Cell (pPGC)-like Cells in Explants into PGCs in Experimental Tadpoles ... 258

NILES W. FOX, IVAN DAMJANOV, BARBARA B. KNOWLES, AND DAVOR SOLTER. Stage-Specific Embryonic Antigen 3 as a Marker of Visceral Extraembryonic Endoderm 263

Features ... f-1

NUMBER 2, JUNE 1984

Full Papers

RYOICHI MATSUDA, DENNIS SPECTOR, AND R. C. STROHMAN. There Is Selective Accumulation of a Growth Factor in Chicken Skeletal Muscle. I. Transferrin Accumulation in Adult Anterior Latissimus Dorsi ... 267

RYOICHI MATSUDA, DENNIS SPECTOR, JULIE MICOU-EASTWOOD, AND R. C. STROHMAN. There Is Selective Accumulation of a Growth Factor in Chicken Skeletal Muscle. II. Transferrin Accumulation in Dystrophic Fast Muscle ... 276

PETER W. ANDREWS. Retinoic Acid Induces Neuronal Differentiation of a Cloned Human Embryonal Carcinoma Cell Line *in Vitro* ... 285

GLEN K. ANDREWS, EILEEN D. ADAMSON, AND LASHITEW GEDAMU. The Ontogeny of Expression of Murine Metallothionein: Comparison with the α-Fetoprotein Gene ... 294

PATRICIA MACAULEY BODE AND HANS R. BODE. Formation of Pattern in Regenerating Tissue Pieces of *Hydra attenuata.* II. Degree of Proportion Regulation Is Less in the Hypostome and Tentacle Zone than in the Tentacles and Basal Disc ... 304

MASASUKE ARAKI. Immunocytochemical Study on Photoreceptor Cell Differentiation in the Cultured Retina of the Chick ... 313

STEPHEN D. THOMS AND DAVID L. STOCUM. Retinoic Acid-Induced Pattern Duplication in Regenerating Urodele Limbs ... 319

KARL HERRUP, THOMAS J. DIGLIO, AND ANTHEA LETSOU. Cell Lineage Relationships in the Development of the Mammalian CNS. I. The Facial Nerve Nucleus ... 329

LINDA Z. HOLLAND, MEREDITH GOULD-SOMERO, AND MILES PAUL. Fertilization Acid Release in *Urechis* Eggs. I. The Nature of the Acid and the Dependence of Acid Release and Egg Activation on External pH ... 337

MARK A. MORTIN AND THOMAS C. KAUFMAN. Developmental Effects of a Temperature-Sensitive RNA Polymerase II Mutation in *Drosophila melanogaster* ... 343

ROSAMUND C. SMITH AND JOHN KNOWLAND. Protein Synthesis in Dorsal and Ventral Regions of *Xenopus laevis* Embryos in Relation to Dorsal and Ventral Differentiation 355

LEA ZISKIND-CONHAIM, NIBALDO C. INESTROSA, AND ZACH W. HALL. Acetylcholinesterase Is Functional in Embryonic Rat Muscle before Its Accumulation at the Sites of Nerve–Muscle Contact ... 369

ROSA-MAGDA ALVARADO-MALLART AND CONSTANTINO SOTELO. Homotopic and Heterotopic Transplantations of Quail Tectal Primordia in Chick Embryos: Organization of the Retinotectal Projections in the Chimeric Embryos ... 378

PETER A. MCCUE, MARY LOU GUBLER, LISA MAFFEI, AND MICHAEL I. SHERMAN. Complementation Analyses of Differentiation-Defective Embryonal Carcinoma Cells ... 399

LAZHAR ZOURGUI, DANIÈLE THARAUD, ALDO SOLARI, SIMON LITVAK, AND LAURA TARRAGO-LITVAK. Stimulation of DNA Synthesis by Microinjection of Diadenosine 5′,5‴-P^1,P^4-Tetraphosphate (Ap_4A) into *Xenopus laevis* Oocytes ... 409

JAMES H. MORRISSEY, KEVIN M. DEVINE, AND WILLIAM F. LOOMIS. The Timing of Cell-Type-Specific Differentiation in *Dictyostelium discoideum* ... 414

NOBUO TAKAGI AND GAIL R. MARTIN. Studies of the Temporal Relationship between the Cytogenetic and Biochemical Manifestations of X-Chromosome Inactivation during the Differentiation of LT-1 Teratocarcinoma Stem Cells 425

MANFRED J. LOHKA AND YOSHIO MASUI. Effects of Ca^{2+} Ions on the Formation of Metaphase Chromosomes and Sperm Pronuclei in Cell-free Preparations from Unactivated *Rana pipiens* Eggs 434

MARILYN J. ANDERSON, STEPHEN G. WAXMAN, AND CHARLES H. TADLOCK. Cell Death of Asynaptic Neurons in Regenerating Spinal Cord 443

ARLENE Y. CHIU AND JOSHUA R. SANES. Development of Basal Lamina in Synaptic and Extrasynaptic Portions of Embryonic Rat Muscle 456

MICHEL VINCENT AND JEAN-PAUL THIERY. A Cell Surface Marker for Neural Crest and Placodal Cells: Further Evolution in Peripheral and Central Nervous System 468

WILLIAM R. JEFFERY. Spatial Distribution of Messenger RNA in the Cytoskeletal Framework of Ascidian Eggs 482

THOMAS E. SCHROEDER AND JOANN J. OTTO. Cyclic Assembly–Disassembly of Cortical Microtubules during Maturation and Early Development of Starfish Oocytes 493

Brief Notes

WERNER F. NADER, GREGORY L. SHIPLEY, ALOYS HUETTERMANN, AND CHARLES E. HOLT. Analysis of an Inducer of the Amoebal–Plasmodial Transition in the Myxomycetes *Didymium iridis* and *Physarum polycephalum* 504

O. M. GULLIKSEN, A. LØVLIE, AND L. KVAMMEN. Different Polypeptides in Two Homologous Cellular Structures: The Microstomal and Macrostomal Oral Apparatus of *Tetrahymena vorax* 511

Author Index for Volume 103 517

Subject Index for Volumes 101–103 518

Organism Index for Volumes 101–103 534

Feature f-1